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Review of issues pertinent to the subsidiary structure of the Commission, including the work of the regional institutions: disaster risk reduction

Report on regional cooperation mechanisms for multi-hazard risk assessment and early warning

Note by the secretariat

Summary

In 2016, Asia and the Pacific continued to be the world's most disaster-prone region. The disaster risk in Asia and the Pacific largely emanates from multiple hazards with transboundary origins and impacts. Furthermore, disasters and poverty are bidirectional in their causative linkages, particularly in certain transboundary areas where multi-hazard risks prevail. Harnessing regional cooperation for transboundary disaster resilience is therefore crucial to achieving the aspirations of the 2030 Agenda for Sustainable Development.

In the Asia Regional Plan for Implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030, adopted at the seventh Asian Ministerial Conference on Disaster Risk Reduction, the importance of enhanced regional cooperation for coherent implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030 and the 2030 Agenda is emphasized. The role of the Economic and Social Commission for Asia and the Pacific (ESCAP) in building resilience in the region is crucial to its future implementation, particularly in multi-hazard early warning systems for transboundary disasters. In this regard, the critical role of the Asia-Pacific Regional Coordination Mechanism, convened by ESCAP, is recognized in the Asia Regional Plan, as is the specific role that the Asian and Pacific Centre for the Development of Disaster Information Management can play in addressing the information and knowledge gaps in transboundary disaster risk and enhancing regional capacity by promoting South-South and regional cooperation.

The present document highlights the work undertaken by the secretariat over the past year, as well as its planned work. It contains an outline of a two-track approach that addresses the unmet needs of multi-hazard early warning systems and creates an enabling mechanism for coherent implementation of the Asia Regional Plan, in support of the Sendai Framework for Disaster Risk Reduction 2015-2030 and the 2030 Agenda.

The Commission may wish to provide guidance on how the secretariat can strengthen its work on transboundary hazards and deepen its work in regional cooperation for disaster risk reduction and resilience in Asia and the Pacific.

* E/ESCAP/73/L.1.

I. Introduction

1. The Sendai Framework for Disaster Risk Reduction 2015-2030 highlighted the need for agreed regional and subregional strategies and mechanisms for cooperation and for progress to be reviewed by regional and global platforms. Regional priorities are identified in the Sendai Framework for Disaster Risk Reduction 2015-2030 as follows: (a) understanding disaster risk; (b) strengthening disaster risk governance to manage disaster risk; (c) investing in disaster risk reduction for resilience; and (d) enhancing disaster preparedness for effective response and to “Build Back Better” in recovery, rehabilitation and reconstruction.¹

2. In the Asia Regional Plan for Implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030, adopted at the seventh Asian Ministerial Conference on Disaster Risk Reduction, held in New Delhi in 2016, regional collaboration and cooperation are fostered to effectively mitigate disaster risks and contribute to greater resilience in the region.² In its two-year action plan (2017-2018), regional cooperation and related North-South, South-South and triangular cooperation mechanisms are recognized as being crucial.

3. Likewise, in resolution 71/12 of the Economic and Social Commission for Asia and the Pacific (ESCAP), it requested the secretariat to foster regional cooperation to address shared disaster risk. Furthermore, in its resolution 72/7, the Commission requests the secretariat to work on regional cooperation to combat sand and dust storms in Asia and the Pacific. Implementation of these resolutions is in support of Sustainable Development Goal 1 to end poverty in all its forms everywhere, Goal 2 to end hunger, achieve food security and improved nutrition and promote sustainable agriculture, Goal 11 to make cities and human settlements inclusive, safe, resilient and sustainable and Goal 13 to take urgent action to combat climate change and its impacts.

4. Natural disasters continue to substantially threaten sustainable development in the Asia-Pacific region, their effects ranging from the destruction of valuable agroecological zones to prevention or reversal of poverty reduction efforts. Since 2005, the region has recorded almost 60 per cent of total deaths, 80 per cent of total affected people and 45 per cent of total economic damage worldwide resulting from disasters.³ In 2016 alone, over 100 natural disasters were reported in the region, amounting to \$27.2 billion in economic losses.⁴ Tropical Cyclone Winston swept through numerous Pacific countries, affecting almost 350,000 people in Fiji⁵ and damaging more than 200 houses in Tonga⁶ and around 495 schools in Fiji.⁷ The

¹ General Assembly resolution 69/283, annex II.

² See www.ndmindia.nic.in/AsiaRegionalPlan.pdf.

³ *Asia-Pacific Disaster Report 2015: Disasters without Borders – Regional Resilience for Sustainable Development* (United Nations publication, Sales No. E.15.II.F.13).

⁴ Centre for Research on the Epidemiology of Disasters, EM-DAT: The International Disaster Database. Available from www.emdat.be (accessed 15 January 2017).

⁵ Office for the Coordination of Humanitarian Affairs, “Fiji: Severe Tropical Cyclone Winston – Situation Report No. 9”, 29 February 2016. Available from <http://reliefweb.int/report/fiji/fiji-severe-tropical-cyclone-winston-situation-report-no-9-29-february-2016>.

⁶ European Commission, “ECHO Daily Flash”, 19 February 2016. Available from <http://erccportal.jrc.ec.europa.eu/ECHO-Flash/ECHO-Flash-List/yy/2016/mm/2>.

⁷ Asian Development Bank (ADB), “ADB provides \$50 million for Fiji cyclone relief”, 30 June 2016. Available from www.adb.org/news/adb-provides-50-million-fiji-cyclone-relief.

total damage and loss figure from the tropical cyclone was estimated at \$1.42 billion, equivalent to 31 per cent of the total gross domestic product of Fiji.⁷ Tropical Cyclone Roanu caused widespread flooding and landslides, affecting Bangladesh, India, Myanmar and Sri Lanka.⁸ In Sri Lanka alone, over 300,000 people were affected by this disaster.⁹

5. The 2015/2016 El Niño, one of the strongest episodes observed in the last 50 years, triggered severe weather anomalies in Asia and the Pacific, ranging from increased frequency of floods and higher intensity of cyclones to prolonged drought. In many Pacific countries, such as Palau and the Marshall Islands, El Niño resulted in the declaration of a state of national emergency. In Papua New Guinea, El Niño critically affected food availability, while the heatwave in South Asia affected hundreds of thousands of people.¹⁰ The collective impacts of these disasters constitute a serious threat to the attainment of Sustainable Development Goals, particularly those related to poverty eradication and food security.

6. Many of these disasters are transboundary in nature. The Asia-Pacific region is home to two of the most seismically active fault lines which cross many national frontiers, particularly in the Pacific Ring of Fire, as well as three major ocean basins – where a cyclone developing in any one basin can affect multiple countries simultaneously – and a number of shared river basins, meaning that disasters and their impacts in Asia and the Pacific regularly spread across national boundaries.

7. The transboundary nature of disasters that traverse geopolitical borders results in widespread socioeconomic and environmental impacts that disproportionately affect poor and marginalized communities. Natural disasters have had a significant impact on people living in poverty. When poor people are affected by disasters, the relative share of their wealth loss is two to three times higher than that of wealthier individuals, largely owing to the nature and vulnerability of assets and livelihoods. A considerable amount of research indicates that natural disasters are partially responsible for the flow of households into poverty.¹¹

II. Progress made

8. In light of the emphasis in the Asia Regional Plan on regional cooperation, the role of ESCAP in building resilience in the region is crucial for its future implementation. In implementing its resolutions, ESCAP has thus given high priority to promoting a deepening and extension of regional cooperation mechanisms, particularly for early warning of multiple hazards. The absolute and relative benefits of early warning systems are significant in terms of protecting lives, assets and well-being (see box).

⁸ Office for the Coordination of Humanitarian Affairs, “Sri Lanka: Floods and landslides – Situation Report No. 2”, 26 May 2016 (available from http://reliefweb.int/sites/reliefweb.int/files/resources/OCHA%20ROAP_SL_Sitrep2.pdf); and European Commission, “ECHO Daily Flash”, 22 May 2016 (available from <http://erccportal.jrc.ec.europa.eu/ECHO-Flash/ECHO-Flash-List/yy/2016/mm/5>).

⁹ Office for the Coordination of Humanitarian Affairs, “Sri Lanka: Floods and landslides – Situation Report No. 2”.

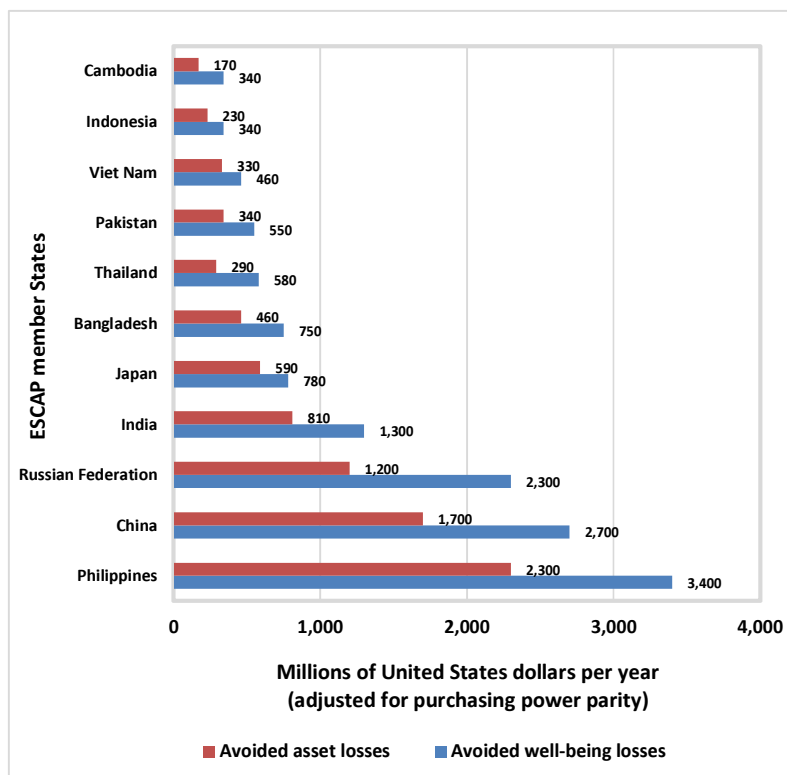
¹⁰ See A/71/230.

¹¹ Stephane Hallegatte and others, *Unbreakable: Building the Resilience of the Poor in the Face of Natural Disasters* (Washington, D.C., World Bank, 2017).

Box

The benefits of early warning systems

Early warning systems can effectively save lives and assets and protect the well-being of vulnerable communities. In simulations undertaken by the World Bank for its recent global report, *Unbreakable: Building the Resilience of the Poor in the Face of Natural Disasters*, the benefits of providing universal access to early warning systems globally were evaluated, with the overall assumption that state-of-the-art warnings can diminish asset loss from storms, floods and tsunamis by up to 20 per cent on average. For certain countries in the ESCAP region covered by this study, the figure reflects asset losses avoided and well-being gains in absolute terms as a result of universal access to early warning systems. A key outcome of the analysis is that asset losses would be reduced by nearly \$13 billion a year globally. Furthermore, gains in well-being would amount to an increase in income of \$22 billion. These findings affirm that investment in early warning systems has a sizeable economic value, over and above the saving of lives, that leads to large improvements in well-being.

Mitigating effects on asset losses and well-being of an early warning system for natural disasters, in absolute terms

Source: ESCAP, adapted from Stephane Hallegatte and others, *Unbreakable: Building the Resilience of the Poor in the Face of Natural Disasters* (Washington, D.C., World Bank, 2017).

A. Tropical cyclones and typhoons

9. ESCAP, together with the World Meteorological Organization (WMO), has promoted cooperation among member States in addressing cross-border risks from tropical cyclones by supporting two subregional intergovernmental platforms, namely the ESCAP/WMO Typhoon Committee and the WMO/ESCAP Panel on Tropical Cyclones. For more than four decades, these two platforms have engaged in capacity-building in forecasting and monitoring tropical cyclones and typhoons by sharing knowledge, expertise and experiences. They have also promoted the integration of meteorology, hydrology and disaster risk reduction by bringing together experts from each.

10. Specifically, in 2016, an ESCAP regional capacity-building workshop on multi-hazard early warning systems organized in Hyderabad, India, in partnership with the Indian National Centre for Ocean Information Services and the Regional Specialized Meteorological Centre in New Delhi, focused on addressing operational needs of multi-hazard early warning systems in marine and coastal areas.

11. Furthermore, following a recommendation that emerged from a joint session of the Typhoon Committee and the Panel on Tropical Cyclones organized by ESCAP in 2015, which encouraged mutual cooperation and joint activities of the two platforms, and with the support of the WMO Regional Training Centre in Nanjing, China, a joint project on multi-hazard early warning systems was funded by the ESCAP Multi-Donor Trust Fund for Tsunami, Disaster and Climate Preparedness in Indian Ocean and Southeast Asian Countries. Numerous capacity development activities for priority member States were also held at the Regional Specialized Meteorological Centres in New Delhi and Tokyo.

Extension to the Pacific subregion

12. In light of the high exposure and vulnerability of the South-Western Pacific to tropical cyclones, ESCAP has sought ways to extend regional cooperation mechanisms to this subregion. This approach is aligned with the Nuku'alofa Ministerial Declaration, adopted on 24 July 2015 at the First Pacific Ministerial Meeting on Meteorology, and the Framework for Resilient Development in the Pacific.¹²

13. Additionally, ESCAP and WMO, through the WMO Regional Association V Tropical Cyclone Committee for the South Pacific and South-East Indian Ocean, are working on extending the inter-agency cooperation framework of the Typhoon Committee and the Panel on Tropical Cyclones to the Pacific member States.

14. This approach was supported by the Pacific member States, which, at the sixteenth session of the WMO Regional Association V Tropical Cyclone Committee for the South Pacific and South-East Indian Ocean, recognized that the ESCAP/WMO partnership could contribute to enhanced operational capacity in cyclone early warning and preparedness and could serve as an important means of sharing experiences from Asia with the Pacific. This subject will be taken up again at the next session of that Committee, in 2018.

¹² See “Framework for resilient development in the Pacific: An integrated approach to address climate change and disaster risk management – Voluntary guidelines for the Pacific island region”, endorsed by the Pacific Islands Forum leaders on 11 September 2016. Available from <http://www.forumsec.org/resources/uploads/embeds/file/Annex%201%20-%20Framework%20for%20Resilient%20Development%20in%20the%20Pacific.pdf>.

15. Commission resolution 71/12 provides the basis for the expansion of the ESCAP Multi-Donor Trust Fund for Tsunami, Disaster and Climate Preparedness in Indian Ocean and Southeast Asian Countries to include Pacific small island developing States. Consequently, in July 2016, ESCAP and the Pacific Community agreed to establish national climate outlook forums, based on the experience of monsoon forums supported by the ESCAP Multi-Donor Trust Fund in South-East Asia and South Asia. It is expected that this partnership will help strengthen the framework for downscaling climate information and data supported by the Regional Integrated Multi-hazard Early Warning System for Africa and Asia, WMO and the Secretariat of the Pacific Regional Environment Programme.

16. A regional capacity-building programme was also initiated on setting up and operating geoportals to support multi-hazard early warning systems, through collaboration with the Pacific Community, the Secretariat of the Pacific Regional Environment Programme, the Asian Institute of Technology and the Indonesian Agency for Meteorology, Climatology and Geophysics. In September 2016, with support from the Government of Japan and jointly with the National Disaster Management Office of Fiji, the Pacific Community and the Secretariat of the Pacific Regional Environment Programme, ESCAP undertook a review of capacity gaps and subsequently developed a regional action plan consisting of a series of capacity development activities to be implemented by ESCAP and partners in 2017 and 2018.

B. Drought and slow-onset disasters

17. Many countries in the region face tremendous challenges in drought monitoring, early warning and management. The agriculture sector is critical for the many people who are reliant on the sector for their basic livelihoods. In addition, the economies of many countries are at least partially dependent on agriculture. Agricultural drought is therefore a serious but underrecognized problem in the Asia-Pacific region.

18. The *Asia-Pacific Disaster Report 2015* underlined that drought has affected more than 1.31 billion people over the last three decades, and has caused damage of more than \$53 billion in the region. The countries in the region have relatively weak capacities to access and analyse critical information, including a lack of effective methodologies to combine space-based data and products with ground-based data for appropriate decision-making. There are very few regional platforms for sharing such knowledge and good practices, and there remains a lack of coordination and cooperation among agencies and institutions at the national level.

19. The ESCAP Regional Cooperative Mechanism for Drought Monitoring and Early Warning, which operates under the guidance of its Regional Space Applications Programme for Sustainable Development, brings together at the regional level resources in space and geographic information system applications. It enhances capacities for integrated analysis of space and in-season ground data and information, and builds the resilience of agrarian communities that are perennially affected by drought. The work of the Regional Cooperative Mechanism is being expanded to move beyond monitoring and early warning. By incorporating satellite-derived information generated by and shared among partners of the Regional Space Applications Programme for Sustainable Development, the Regional Cooperative Mechanism is enhancing seasonal forecasts, longer-term risk analysis, impact-based forecasting and other tools for managing and adapting to drought.

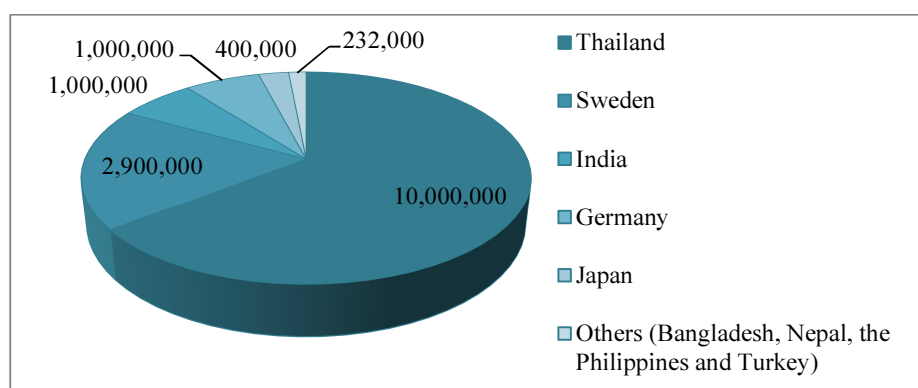
20. The 2015/2016 El Niño led to prolonged drought in many parts of the Asia-Pacific region. To support the preparedness of affected countries, ESCAP and the Regional Integrated Multi-hazard Early Warning System for Africa and Asia jointly issued advisory notes to communicate risk scenarios emanating from the complex El Niño event. Furthermore, ESCAP, together with the Regional Integrated Multi-hazard Early Warning System for Africa and Asia and the United Nations Development Programme (UNDP), developed a methodology for El Niño risk assessment to better understand the complex dynamics and communicate scientific knowledge of El Niño to key stakeholders.

21. For countries with critical vulnerabilities – namely Cambodia, Myanmar and Sri Lanka – ESCAP has put in place monsoon forums, which are national climate outlook forums whose aim is to communicate disaster risk information that is actionable through downscaled climate outlooks, seasonal forecasts and in-season drought monitoring using earth observation satellites. The monsoon forums are owned and adapted by the respective countries, and are multi-stakeholder risk communication platforms where scientific knowledge is communicated and policies are put into practice for disaster preparedness and resilience. The El Niño weather phenomenon has featured prominently in the monsoon forums.

C. Innovative financing: the ESCAP Multi-Donor Trust Fund for Tsunami, Disaster and Climate Preparedness in Indian Ocean and Southeast Asian Countries

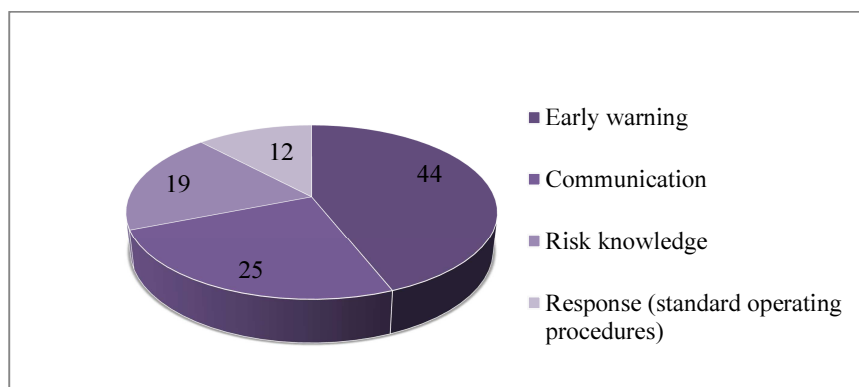
22. The ESCAP Multi-Donor Trust Fund for Tsunami, Disaster and Climate Preparedness in Indian Ocean and Southeast Asian Countries continues to provide financial and technical support to address unmet needs and gaps in early warning systems in the Asia-Pacific region. It has promoted innovative pilot initiatives, scaled up successful early warning systems and facilitated regional cooperation by leveraging the convening power of ESCAP. Advocating a multi-hazard people-centred approach, the ESCAP Multi-Donor Trust Fund works with key partners of the United Nations system, regional intergovernmental institutions, member States, non-governmental organizations and academic institutions in the area of early warning. As of February 2017, it had received contributions totalling \$15.5 million. Figure I shows the donors and their respective shares.

Figure I
Contributions to the ESCAP Multi-Donor Trust Fund for Tsunami, Disaster and Climate Preparedness in Indian Ocean and Southeast Asian Countries, 2005-2016
 (United States dollars)



23. Since its establishment in 2005, the ESCAP Multi-Donor Trust Fund has supported 26 projects with a total budget of approximately \$15.5 million, directly benefiting 19 countries. Figure II shows the allocation of funding by subject area.

Figure II
Thematic areas of ESCAP Multi-Donor Trust Fund projects (2005-2016)
 (Percentage)



24. The ESCAP Multi-donor Trust Fund is recognized for having provided sustained financial support that contributed to the establishment of the Indian Ocean Tsunami Warning and Mitigation System and the Regional Integrated Multi-hazard Early Warning System for Africa and Asia. The former, which became operational in 2011, is a system that brings together 28 member States that now share information and combined technical capacities. The latter is an intergovernmental institution that focuses on generating early warning information, technical support and capacity-building, and providing cost-effective solutions for high-risk low-capacity countries. The ESCAP Multi-Donor Trust Fund is also recognized for having bolstered regional cooperation of member States through the ESCAP/WMO Typhoon Committee and the WMO/ESCAP Panel on Tropical Cyclones.

25. Learning from the progress made in regional and national early warning systems and recommendations from independent reviews, the ESCAP Multi-Donor Trust Fund is now entering a new strategic phase (2017-2020). Fully integrated with the ESCAP programme of work and strategic priorities for implementing the Sendai Framework for Disaster Risk Reduction 2015-2030 and the Sustainable Development Goals, the pillars of this strategy focus on: (a) regional cooperation by interlinking partnerships between the Regional Integrated Multi-hazard Early Warning System for Africa and Asia, the Typhoon Committee, the Panel on Tropical Cyclones and others; (b) extension of the ESCAP Multi-Donor Trust Fund to the Pacific; (c) investment in climate risk management; and (d) incorporation of innovations from civil society and the private sector. The pillars benefit from scientific innovations and good practice, notably through regional and national initiatives on weather and climate services.

26. At the outset of this 2017-2020 strategy, several new projects will be initiated. The first will support regional cooperation within and between the Typhoon Committee and the Panel on Tropical Cyclones, and will promote the roll-out of the ESCAP-funded technical guidance on synergized standard operating procedures for multi-hazard early warning systems. The second will be a partnership with the Regional Integrated Multi-hazard Early Warning System for Africa and Asia and WMO to replicate and disseminate the experience from the seasonal monsoon forums to the Pacific island countries.

Additional initiatives under consideration aim to respond to gaps in end-to-end early warning in the Mekong riparian countries, as well as tsunami-exposed countries situated in the Arabian Sea.

III. Looking forward: addressing gaps in early warning

27. To address gaps in early warning pertaining to transboundary floods, tsunamis and sand and dust storms, ESCAP is undertaking the following initiatives.

A. Transboundary floods, including flash floods, landslides and glacial lake outburst floods

28. As shown in section I, floods have been the most devastating natural disasters to impact poor people at the global level. The same holds true for the Asia-Pacific region. In 2016 alone, almost 2,500 lives were lost and over nine million people were affected by floods.¹³ In particular, floods in transboundary river basins in the region have led to severe damage and loss. Between 2000 and 2010, floods in the Indus, Ganges and Brahmaputra-Meghna river basins, among others, resulted in over 20,000 fatalities from floods with combined damage of around \$30 billion. During the same period, in the Mekong river basin, flooding caused nearly 3,000 fatalities and \$2.7 billion in damage. These river basins are also home to large poor populations, which are chiefly dependent on agriculture as their primary source of income and livelihood.

29. In this regard, it is critical to improve regional cooperation for operational flood forecasting and early warning systems in shared river basins. The Committee on Disaster Risk Reduction at its fourth session, in 2015, requested the secretariat to work toward establishing a regional cooperation mechanism for early warning for transboundary river basins.

30. Relatedly, and despite increased availability of tools to predict the risks, flash floods, landslides and glacial lake outburst floods continue to cause high death tolls and economic losses in many countries of the Asia-Pacific region. While several initiatives have been undertaken to strengthen regional cooperation, there is a need to consolidate initial efforts to reflect the transboundary nature of these hazards as well as to scale up successful pilot initiatives into effective and sustainable regional cooperation mechanisms.

31. To this end, ESCAP is conducting feasibility studies with funding support from the German Agency for International Cooperation, and an expert meeting will be organized later this year to review the findings and further facilitate regional cooperation for early warning across this gamut of water-related disasters.

32. ESCAP has also supported capacity-building. In mid-2016, a toolkit for flood forecasting and early warning in transboundary river basins was prepared, jointly with the Regional Integrated Multi-hazard Early Warning System for Africa and Asia, and shared at a regional capacity-building workshop held in Pathum Thani, Thailand, in October 2016, where training was provided to meteorologists, hydrologists and disaster management experts from riparian countries of the Indus, Ganges and Brahmaputra-Meghna basins (Bangladesh, Bhutan, China, India and Nepal). Experts from the International

¹³ Centre for Research on the Epidemiology of Disasters, EM-DAT: The International Disaster Database. Available from www.emdat.be (accessed 15 January 2017).

Centre for Water Hazard and Risk Management of Japan, the European Centre for Medium-Range Weather Forecasts, the Mekong River Commission and the Regional Integrated Multi-hazard Early Warning System for Africa and Asia introduced recent advances in tools and techniques based on innovative space applications.

B. Tsunami early warning

33. In contrast with the eastern Indian Ocean, limited attention and resources have been directed towards preparing for tsunamis in the Makran subduction zone, situated in the north-west Indian Ocean. In this zone, coastal communities including major cities are at threat from locally generated tsunami waves that could potentially inundate coastlines within 20 minutes of a powerful earthquake.

34. In partnership with the Intergovernmental Oceanographic Commission of the United Nations Educational, Scientific and Cultural Organization (UNESCO) and others, the ESCAP Multi-Donor Trust Fund has facilitated scientific and field studies and increased awareness among key stakeholders and communities. A network of experts from India, the Islamic Republic of Iran, Oman and Pakistan was established, alongside an international support network for research, with participation from Chile, Indonesia, Sri Lanka, Thailand and the United States of America. It will further address gaps in regional cooperation.

35. Notwithstanding the above, further investment in tsunami risk reduction to ensure a sustainable solution for all countries at the rim of the Indian Ocean in an inclusive manner is important. Optimizing upon the effectiveness of various ESCAP regional cooperation platforms, ESCAP will further promote cooperation in tsunami early warning that is focused on last-mile connectivity, notably by supporting the periodic regional Indian Ocean tsunami wave exercise. Building awareness of tsunami risks and effectiveness of multi-hazard tsunami warning systems ensures sustainability and multiplies benefits, particularly for high-risk and low-capacity countries in both the Indian Ocean and Pacific basins.

C. Combating sand and dust storms

36. Sand and dust storms are transboundary in nature, as their sources and affected areas can be situated far from each other. In this regard, the ESCAP Asian and Pacific Centre for the Development of Disaster Information Management in Tehran has as an initial focus the goal of combating sand and dust storms in South and South-West Asia and Central Asia. This work is centred on three institutional pillars of the Centre: (a) regional repository for information and knowledge; (b) capacity development in disaster information management and technical assistance; and (c) information services for cross-border disasters. The Centre will work closely with the Government of the Islamic Republic of Iran and relevant United Nations programmes and funds.

37. Through a wider partnership network, the Centre will mobilize information and knowledge-sharing across a wide swathe of countries in Asia that are affected by sand and dust storms for multi-scale interventions.

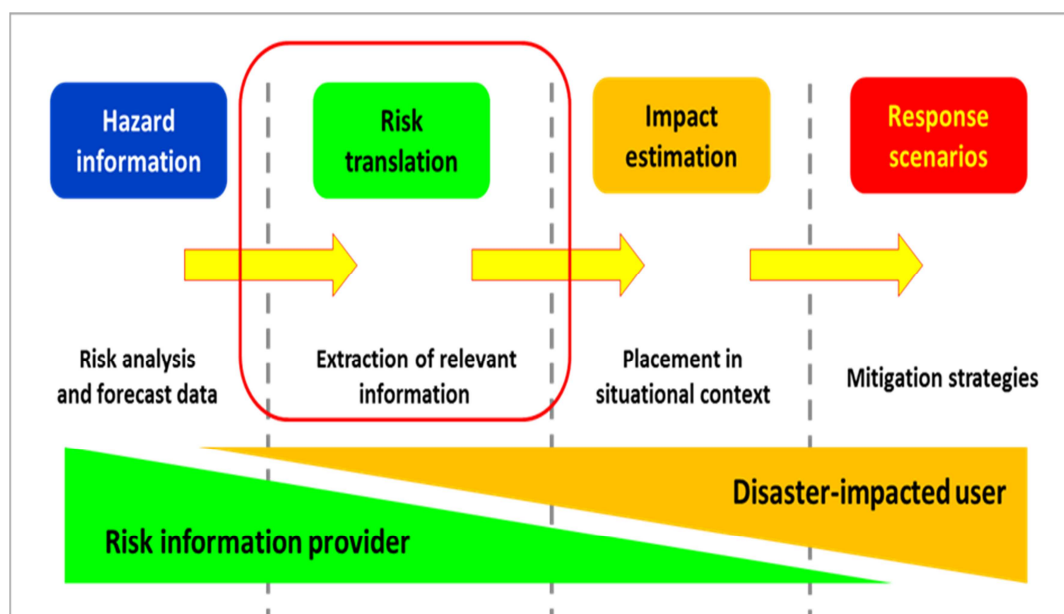
D. Impact-based forecasting and risk-informed early warning

38. With improved forecasting and advanced geospatial modelling for vulnerability and exposure assessment, early warning systems are becoming more impact-based and risk-informed. This should result in an improved

understanding of social vulnerabilities so that warnings can be tailored to the communities at risk. This involves a chain which starts from hazard information, leading to its translation through risk analysis and forecast data, then to impact estimation, and lastly to the development of specific risk scenarios for short-term response, mid-term interventions and long-term mitigation actions (figure III). Impact-based forecasting brings the risk information providers – particularly the hydrometeorological, seismological and geospatial community – closer to disaster management authorities and related sectoral ministries. It is an important multisectoral approach to make multi-hazard early warning systems more effective, and it represents a process of graduation from early warning to early action for mitigation.

39. ESCAP has prioritized ongoing analytical work, capacity development and regional cooperation activities on promoting impact-based forecasting and risk-informed early warning. In this regard, the three-pillar approach of the Asian and Pacific Centre for the Development of Disaster Information Management focused on delivering actionable multi-hazard risk information, particularly for disasters with transboundary origins and impacts. It is also expected to contribute substantially to operationalizing this new approach. The Centre organized regional capacity development training on seismic microzonation, and highlighted scenario-based impact assessment for earthquakes of different magnitudes. In the future, the Centre’s work will focus on a multi-hazard approach for impact-based forecasting and risk-informed early warning.

Figure III
Impact-based forecasting and multi-hazard early warning systems



Source: ESCAP, based on Baode Chen and Xu Tang, “Translating weather forecasts into impact-relevant information: Impact-based forecast in weather forecast operation”, presentation available from www.wmo.int/pages/prog/drr/events/WCDRR-MHEWS/documents/BaodeChenandXuTang.pdf.

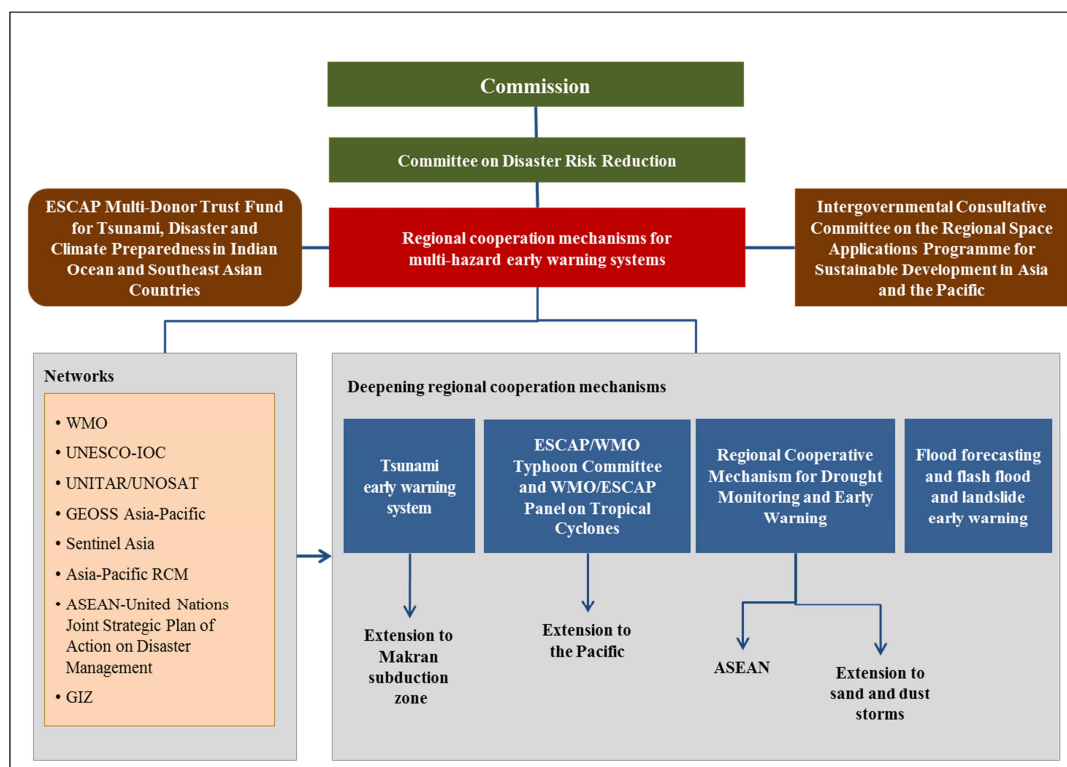
IV. ESCAP approach for transboundary disaster resilience

40. ESCAP is adopting a twin-track approach to harnessing regional cooperation for transboundary disaster resilience (figure IV). With the support of the ESCAP Multi-Donor Trust Fund, this will be accomplished through well-established ESCAP networks, notably the Regional Space Applications Programme for Sustainable Development, which enables access to a variety of real-time satellite data and products for disaster-affected countries. Through the Regional Space Applications Programme, ESCAP is also a participating organization of the Group on Earth Observations, which is developing the Global Earth Observation System of Systems, a global network of existing individual systems and infrastructure that uses common standards to share Earth observation information with a broad range of users. As a participating organization, ESCAP can help augment access for member States, especially linking up low-capacity countries to multiple arrays of observation systems. In turn, ESCAP contributes to the Global Earth Observation System of Systems by linking regional good practices and needs to the global Earth observation community. For example, the Regional Cooperative Mechanism for Drought Monitoring and Early Warning is a programme highlighted in the workplan on water of the Global Earth Observation System of Systems.

41. The first track covers regional leadership by ESCAP in implementation of the International Network for Multi-Hazard Early Warning Systems, a key outcome of the Third United Nations World Conference on Disaster Risk Reduction held in Sendai, Japan, in 2015. Specifically, during the forty-third session of the WMO/ESCAP Panel on Tropical Cyclones, held in New Delhi in May 2016, ESCAP and WMO agreed to focus on impact-based forecasting and risk-informed early warning for coastal hazards including tropical cyclones in the Bay of Bengal and the Arabian Sea. The members of the Panel expressed support for pilot projects for impact-based forecasting in selected countries.

42. This work was taken forward when at a thematic session of the seventh Asian Ministerial Conference on Disaster Risk Reduction, co-organized by ESCAP and WMO, it was agreed to increase availability of and access to multi-hazard early warning systems by augmenting the engagement of the WMO/ESCAP Panel on Tropical Cyclones, the ESCAP/WMO Typhoon Committee and related stakeholders. The specific needs of information users were identified, such as users in the agricultural sector, disaster management agencies, communities and individuals in disaster-prone areas. Information on recent technological and policy developments was shared, and regional experiences on how best to connect space-based technology with communities and individuals at risk for end-to-end warning systems were exchanged. The outcome of the session contributed substantially to the Asia Regional Plan for Implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030 and helped shape the regional component of the International Network for Multi-Hazard Early Warning Systems.

Figure IV
ESCAP approach for transboundary disaster resilience



Abbreviations: ASEAN, Association of Southeast Asian Nations; GEOSS, Global Earth Observation System of Systems; GIZ, German Agency for International Cooperation; IOC, Intergovernmental Oceanographic Commission; RCM, Regional Coordination Mechanism; UNITAR, United Nations Institute for Training and Research; UNOSAT, Operational Satellite Applications Programme.

43. These initiatives will be further refined at the Multi-Hazard Early Warning Conference to be held in Cancún, Mexico, in May 2017, in conjunction with the Global Platform for Disaster Risk Reduction. ESCAP, together with the Intergovernmental Oceanographic Commission of UNESCO, will lead the session on regional cooperation and partnerships for multi-hazard early warning systems. The outcomes of the conference will feed into the outcome of the global platform as well as deliberations of the Committee on Disaster Risk Reduction at its fifth session, in October 2017.

44. The second track envisages a strengthening of regional cooperation and partnerships. The main components of this track will be the following: (a) deepening the ESCAP/WMO partnership by extending the work of the ESCAP/WMO Typhoon Committee and the WMO/ESCAP Panel on Tropical Cyclones to the Pacific; (b) strengthening the partnership between ESCAP and the Intergovernmental Oceanographic Commission of UNESCO by extending end-to-end tsunami early warning to the Makran subduction zone in the Arabian Sea; (c) with the support of the German Agency for International Cooperation, establishing a regional cooperation mechanism for early warning of transboundary floods in river basins; and (d) enhancing the Regional Cooperative Mechanism for Drought Monitoring and Early Warning by focusing on combating sand and dust storms. Furthermore, ESCAP is undertaking a study in collaboration with the Association of Southeast Asian Nations on the subregion's policy specificities for drought risk mitigation.

Asia-Pacific Regional Coordination Mechanism Thematic Working Group on Disaster Risk Reduction and Resilience

45. The Asia-Pacific Regional Coordination Mechanism has been promoting increased cooperation and policy-level coherence among United Nations entities and regional associations. Through its thematic working groups, improved cooperation on specific operational and programmatic issues related to the 2030 Agenda has become possible, including disaster risk reduction and resilience. Specifically, the Thematic Working Group on Disaster Risk Reduction and Resilience promotes using joint strategic frameworks, sharing good practice across the subregions, connecting various regional organizations and linking these regional initiatives with the Asia-Pacific Forum on Sustainable Development and the Sustainable Development Goals. The Thematic Working Group is a prime example of a “One United Nations” approach to building disaster resilience in the region, and is co-chaired by ESCAP, United Nations Office for Disaster Risk Reduction and UNDP.

46. ESCAP intends to capitalize on the work of the Thematic Working Group on Disaster Risk Reduction and Resilience to advance its own work on regional cooperation mechanisms for multi-hazard early warning systems. In this regard, two key products that will guide the approach towards El Niño resilience building are a joint publication on assessment of risks associated to El Niño using a stepwise process and one on lessons learned from El Niño. ESCAP is now in the process of finalizing these knowledge products together with UNDP, the Office for the Coordination of Humanitarian Affairs, the Regional Integrated Multi-hazard Early Warning System for Africa and Asia and the Asia-Pacific Economic Cooperation Climate Centre.

47. Furthermore, as part of an inter-agency steering committee on El Niño under the Thematic Working Group on Disaster Risk Reduction and Resilience, ESCAP participated in El Niño focus group discussions in 2016 to provide feedback on a blueprint for action being developed by the United Nations Special Envoy of the Secretary-General on El Niño and Climate.

V. Issues for consideration by the Commission

48. Multi-hazard early warning systems offer common opportunities to address the goals and targets related to disaster risk reduction and resilience in the Sustainable Development Goals, Sendai Framework for Disaster Risk Reduction 2015-2030 and the Paris Agreement. Recognizing its important enabling role, ESCAP will accord priority to implementation of regional approaches for multi-hazard early warning systems. In this respect, ESCAP will continue to work on strengthening and extending regional cooperation mechanisms for early warning of natural hazards, in support of the 2030 Agenda for Sustainable Development. In implementation of these initiatives, it is envisaged that the Asia-Pacific Regional Coordination Mechanism, through its Thematic Working Group on Disaster Risk Reduction and Resilience in particular, will serve as a platform contributing to the “One United Nations” approach to building resilience to natural disasters in the Asia-Pacific region.

49. In view of the above, the Commission may wish to provide guidance and share experiences and views with the secretariat on the approach of ESCAP to harnessing regional cooperation for transboundary resilience.